July 1953

THE CHEMIST

VOLUME XXX NUMBER 7

DR. GAMES SLAYTER

Receives Ohio Award

(See page 335)

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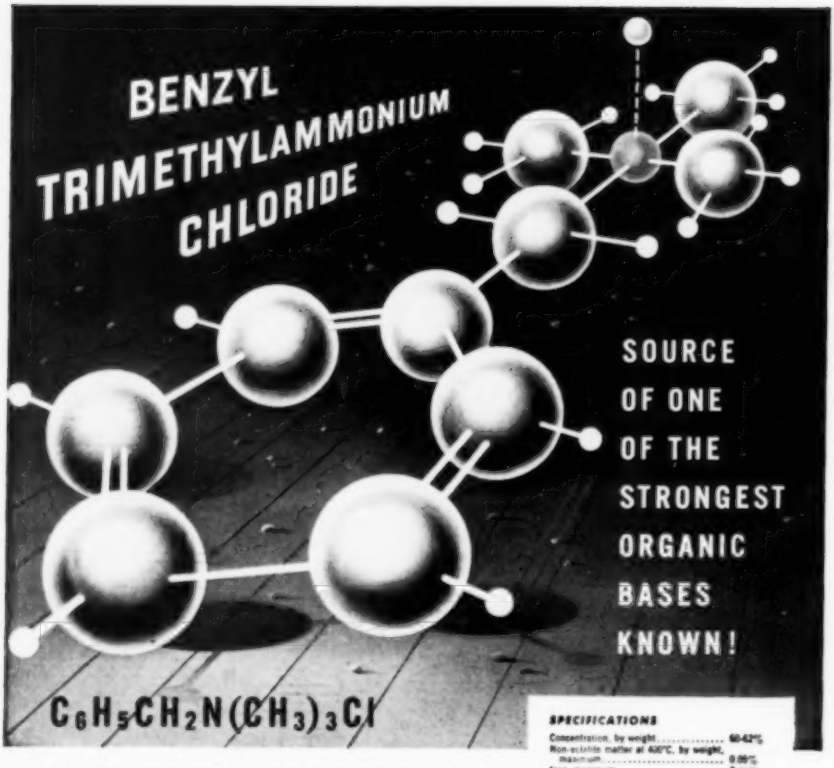

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Report on Pension Plan for Self-Employed Chemists

Benjamin Sweedler, F.A.I.C.

Chairman of Special AIC Committee to Consider this Subject

COMPANY employees enjoy important tax savings under the pension plans qualified under Section 165 of the Internal Revenue Code. About 8,000,000 people obtain these benefits under 16,000 company sponsored pension plans. Self-employed chemists and other self-employed individuals cannot obtain such tax savings.

It is the objective of the Jenkins-Keogh Bill H. R. 10-11 to correct this inequality. The Jenkins-Keogh Bill, introduced in the present session of Congress, takes the place of the Reed-Keogh Bill introduced in 1951. No action was taken on the Reed-Keogh Bill due to lack of time for consideration by the House Ways and Means Committee.

The Jenkins-Keogh Bill is officially designated as "a bill to encourage the establishment of voluntary pension plans by individuals". Under this Bill an individual not covered by any existing retirement plan may exclude from his taxable income each year an amount, not in excess of 10 per cent of his earned income, which he has paid over either to a restricted retirement fund or to an insurance company as a premium on a restricted annuity contract. The maximum annual deduction cannot exceed $7,500.00 and the aggregate during the life of the taxpayer may not exceed $150,000.00. Persons over fifty five years of age are allowed to deduct an increasing percentage each year above the 10 per cent limit, in order that they may build up worth while retirement funds during the remaining working years alloted to them.

The retirement benefits for the individual after reaching age sixty-five may be either a lump sum payment carrying a capital gains tax; annual, quarterly or monthly installments for a period of years; or the purchase of a life annuity contract upon retirement. Payments received under the installment or annuity method would be taxed as ordinary income when received.

The Jenkins-Keogh Bill will enable self-employed chemists and many others to build up their own programs of retirement benefits. The creation of such programs heretofore has been practically impossible under the staggering tax rates in existence.

It behooves all of us to encourage actively the widest understanding of the importance of this Bill and to take whatever action we can to in-

sure its passage. Probably the most helpful action that can be taken at this time is to communicate with your Congressman (if possible by personal discussions), and particularly with the members of the House Ways and Means Committee, soliciting their support for the Bill. The present members of the House Ways and Means Committee are listed below:

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To New York: Robert R. Dean, M.A.I.C., from Virginia-Carolina Chemical Corp., Richmond, Va. He is now with Westvaco Chemical Div., Food Machinery & Chemical Corp., Chrysler Building, East, New York, N. Y.

To Europe: Dr. Alexander Silverman, Hon. AIC, professor of chemistry, emeritus, University of Pittsburgh, who flies on July 20th to attend the International Congress of Chemistry in Stockholm and Uppsala, Sweden, July 29th to August 7th. He is vice president of the Commission on Inorganic Nomenclature of the International Union of Chemistry, whose sessions are scheduled concurrently with those of the Congress. Dr. Silverman also expects to visit glass factories in France, Belgium, Holland, Denmark, Norway, Sweden, and Finland.

Appointed: By Central Scientific Company, Chicago, Ill., Russell L. Lawson, formerly vice president of Utica Knitting Co., Utica, N. Y., as executive vice president.

Evidence of Glass Structure

Dr. Games Slayter, F.A.I.C.

Vice-President, Research, Development and Engineering, Owens-Corning Fiberglas Corporation, Newark, Ohio

(Presented when the Ohio Award of the AIC Ohio Chapter was given to him, May 1, 1953, at Toledo, Ohio.)

A FEW historical things that have puzzled people working with glass for many years have been indicative that glass is a heterogeneous solid and not a super-cooled liquid. Recent pictures made with an electron microscope, to my mind, confirm this reasoning. In what I have to say on this matter, I do not care whether people disagree with me, but I would be greatly disappointed if what I say is ignored.

This paper was prepared in the hope of stimulating work in many places along this line. The author will accept disagreement, but would be greatly disappointed if what he has to say is ignored!

We are all familiar with the fact that when etched, certain patterns are apparent in glass. We are all familiar with the brush marks on the outside of bottles. We are all familiar with the fact that the change in properties of glass tempered by chilling the outside surfaces quickly, can not be accounted for entirely by such a simple mechanical explanation as putting the skin under compression. We feel something more than mere compression has happened.

After the Vycor process was developed some years ago for leaching the fluxes away from a body of glass, we leached fibers which had not been previously heat treated. The fibers that we leached were shock cooled, in the sense that all fibers which are pulled in fine dimension at high speed are shock cooled, probably more rapidly cooled than could ever be done with a massive piece of glass by plunging it into a liquid or blowing air on it. From this glass, leached by hydrochloric acid, all of the fluxes were dissolved away leaving all of the silica behind. This was determined by chemical analysis. The resulting leached fiber had considerable strength, and cloth woven of it had good mechanical properties. It was highly absorbent, acting like silica gel, and would take up 35 or 40% of its own weight in water. It would be difficult indeed to conceive of this fiber having been taken into solution by the leaching action and the silica structure redeposited. The structure must have been there in the first place.

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Figure 1. Electron microscope pictures of E-glass fiber as formed (unleached). Diameter = 0.15 micron.

Figure 2. Electron Microscope picture of E-glass fiber (dia. = 0.15 micron) leached with 4 N Hcl for 4 hours at 90°C. Rinsed with water and dried in air at 150°F.

Figure 3. Same as Fig. 2 except the narrower of the two fibers in this picture shows unusual evidence of the silica structure.

Figure 4. Electron microscope picture of E-glass fiber leached with 4 N Hcl for 21 days at room temperature. Rinsed with water and air-dried at 350°F.

The first picture is of "E" glass fiber. The approximate weight percent compositon of "E" glass is: SiO_2 - 54; MgO - 4; CaO - 16; B_2O_3- 10; Al_2O_3 - 15.

We know by leaching masses of these fibers, that after properly leaching and rinsing with water slightly on the acid side, all of the silica is left and all of the other materials are gone. You will note in Figure 1, which was taken *before leaching*, that there is structure definitely evident in the glass.

Figures 2 and 3 are of the same lot of fiber after leaching. It still has structure and the structure is similar in nature, although easier to see, to the structure in the fiber before leaching. To my mind, it is evident that the silica structure was present all the time; that it was in the glass before it was leached, as it is there after it was leached. This, to my mind, proves that glass is a heterogeneous solid and not a homogeneous solid. It is a two-phase structure, composed of a continuous silica lattice with a flux filling up the voids. Now the very fact that the leached structure will readily fill up with water and that it takes considerable effort to get that water out, means there are considerable surface forces causing the water to be drawn in. It would seem to be sufficient force to account for the fact that the fluxes are held in place before leaching.

In the case of this leached fiber the silica structure does not appear to

come to what was the surface of the fiber and its raises the rather interesting speculation that perhaps where we have been talking about wetting of the silica surface, and properties of the silica surface, that maybe the surfaces we have been dealing with have been fluxes. In the case of "E" glass they would be magnesium oxide, calcium oxide, etc. Since these oxides hydrate readily in contact with water, and since there is carbon dioxide in the air, it is an interesting speculation to wonder whether we have not been dealing with a limestone surface, or something of that sort. Understand, I am not saying this is so, I am just raising the question as one worth some consideration.

In my discussion I am not attempting to go into too much detail. Scientific papers dealing with the investigation will be coming from the men who are engaged in it from time to time. I am merely outlining the investigation.

Figure 4 is of leached fiber which has had some heat treatment and which indicates a coarsening of the structure. This point is not fully explored except that in one glass marble, made of this same kind of glass when crushed, we found particles of dust that have coarse structure and particles that have fine structure. We think this is due to shock cooling of the shear, and that the fine structure arises from shock cooling. The center of the marble is cooled over a longer period of time and has the coarser structure.

It is evident that there are many hours of work to be done by many scientists on many electron microscopes before the questions which quickly arise can be answered.

One reason for speaking on this subject is the hope of stimulating work in many places along this line. It took many years to develop theory in the practice of metallurgy. The metal alloys are of great variety and number. Glass is formed by creating solutions of metal oxides in each other under heat. There are just as many varieties of glass as there are of metal alloys, and it is apparent that the field of structure in glass lies below that which can be investigated by an optical microscope. It will take just as many hours of work and just as many scientists working on it, before as good an understanding of the structure of glass and its properties is reached, as has been reached in the case of the metal alloys.

Outside the field of glass technologists and even within the field, there has been too much of a tendency to think of glass as glass and not to think in terms of the great variety of properties that can be expected and hoped for.

Now, I shall mention the basic concepts of the strengths of materials. I have a fishing pole made of Fiberglas-reinforced plastic. This fishing pole can be cut or notched and it

will have the full strength of the remaining cross-section after cutting or notching it. That is because glass fibers with a modulus of elasticity of 10-million are embedded in a matrix of resin which has a modulus of elasticity in the region of less than 1 million. When this pole is flexed, the fibers develop their full strength before the supporting matrix is sufficiently stressed to propagate a crack so that any scratches or cracks in the surface, or within any of the glass fibers, will not match each other.

I have a bamboo fishing pole which was made by nature and which exhibits similar properties. This bamboo pole is composed of lignin having a modulus of elasticity of 1½ million, bonding together organic fibers which have a modulus of elasticity of 14-million. One of the common applications of this principle is in reinforced concrete where the steel has a modulus of elasticity of 30 million and the concrete of 8-million. We put glass fibers in concrete (and we can protect them so that the line of the concrete does not injure the fibers), but the combination cracks very easily. While it is a heterogeneous solid, it is a 2-phase system in which the moduli of elasticity of the 2 phases are too nearly identical. This allows a crack to propagate readily.

Plaster of Paris without the reinforcement of Fiberglas would have about the mechanical properties of an empty egg shell. The modulus of elasticity of the plaster of Paris is 2 million; the reinforcing glass fiber is 10-million, and the reinforced piece has excellent mechanical properties. It is tough; it is flexible; it is strong; and it has impact resistance.

Now, the glasses with which we are generally familiar are based on silica. If we separate the fluxes, calling everything but the silica fluxes, we find that, in general, they have a modulus of elasticity in the range of 8 to 10 million. Silica itself is unique among refractory materials in that it has a modulus of elasticity in its various forms in the range of 10-million. There are other glass-making oxides which have modulus of elasticity in a much higher range, for instance, alumina, titania, zirconia, all of which have modulus of elasticity in the range of 50- to 60-million. Suppose we could produce glasses, and I believe we could, which have structures similar to the silica structures you have seen in the electron microscope pictures shown here, but with those structures composed of metal oxides with much higher modulus of elasticity than the flux materials lying between them. Such a glass would not be scratch, notch or bruise sensitive. It would be tough and strong like Fiberglas-reinforced plastic; or like a piece of reinforced gypsum; or like a bamboo pole. Articles pressed or blown from such a glass would have strength, toughness, and dependability equal to or better

than the metals, and we would expect their density to lie in the range of aluminum — light-weight as compared to steel.

We spend millions of dollars and that means millions of man-hours capturing the metals from their oxides. We then spend additional millions of dollars and man hours manufacturing protective coatings to prevent metals from going back to their natural state, oxides.

Looking into the long-range future, it would seem that if we are willing to spend the necessary research-dollars and man-hours, we can look forward to creating glasses which will serve man better than the metals in many uses and applications.

Acknowledgement

Electron microscope photographs prepared by Dr. A. F. Prebus, Professor of Physics, Ohio State University. Interpretations of pictures by Dr. Prebus in cooperation with Dr. John W. Michener, Research Dept., (Physics) Owens-Corning Fiberglas Corporation, Newark, Ohio.

Introduction of Dr. Games Slayter

Carl G. Staelin

Secretary, Owens-Corning Fiberglas Corporation, Toledo, Ohio

(Given when Dr. Slayter received the Ohio Award of the AIC Ohio Chapter, May 1, 1953, at Toledo, Ohio.)

DR. SLAYTER'S rich biography is so well covered in *Who's Who* and various other sources, that I will touch only a few highlights. His professional training, started at Purdue University in 1917, was interrupted by his enlistment in the army in the first World War. While serving abroad and moving up over No Man's Land, his insatiable curiosity, which has since proved so valuable, overcame him when he saw a curious scientific instrument down in the bottom of a shell hole. Thinking this could be a new invention of the devil which the Germans might be using, he went down to capture it for our Intelligence. The shell hole proved to be full of gas. He was badly overcome. Fortunately, a rescue squad pulled him to safety. He was carried to the rear in the same ambulance with the severely-wounded, Colonel Wild Bill Donovan of his Rainbow Division. Games thus won his Purple Heart.

Dr. Slayter has been vice president and director of research of Owens-Corning Fiberglas Corporation since its organization in 1938, and served with Owens-Illinois Glass Company from 1931 to 1938 in charge of research and development of fibrous glass products. It has been my pleasure to work closely with Dr. Slayter in this project since 1935, as patent

counsel and in corporate and legal matters. In eighteen years I have seen his imagination at work; his ideas take concrete form. He would first conceive an idea, then direct exploratory tests and experiments, next set up pilot plant production, induce consumer acceptance, and finally go into large scale commercial production.

I shall not forget my first contact with Games Slayter. I was fresh out of school, spending a few weeks of training at the Newark Laboratories. An observation he made to me struck me as a little startling, but has since been proven many times. He said that the most important quality for a man to be successful in research and development was "enthusiasm." He explained that enthusiasm not only spurs one's self, but, more importantly, infects and inspires others whose contributions are so necessary, to direct their efforts earnestly to the achievement of the goal.

If it were possible to single out one attribute in Games Slayter which has been responsible for his accomplishments, I should say it would be enthusiasm. From my very first contact with him, I was impressed with this quality, and its contagion to his colleagues.

It is perhaps not too unusual for a person to be ebullient about his own ideas; but it is much more unusual to find a man who can infuse others. Games has done this not only with his associates in the research field; but also with corporate executives responsible for making appropriations of money to support research and development. In the last six years the Fiberglas Company, pursuant to his recommendation or counsel, has authorized expenditures for research and development averaging over three-million dollars annually, and the trend is upward.

Enthusiasm alone is not sufficient; there must be performance justifying the continuing expenditures. In judging results, however, one can never expect one-hundred per cent performance. As all patent lawyers and professional inventors know, the mortality rate on ideas is extremely high. Out of those having promise, only about twenty per cent eventuate into patent applications. Out of all applications, roughly seventy per cent are awarded patents. Of all patents issued, only about five to ten per cent finally achieve commercial production. These figures are very rough, but typical of the experience of many companies. In the case of Games Slayter, there are over one-hundred U. S. patents issued bearing his name, of which an unusually high percentage have been used in commercial production in a broad and basic way. He has an extraordinary high batting average; or if I am permitted a bit of alliteration, a propensity for profitable profundities.

I shall review briefly his principal

inventions that have laid the basis for new industries and thousands of jobs.

One of his earliest ideas to be adopted was the blowing method for insulating old houses with nodulated insulation. The mineral wool industry now insulates thousands of homes yearly with this technique.

Games Slayter next turned his attention to new uses of glass for the building industry, such as glass blocks, glass foam, and fiber insulation. With these ideas he caught the eye of Owens-Illinois management, who were casting about for new outlets for glass to keep their furnaces in operation as the depression deepened.

When coarse broomstraw-like glass fibers were first being experimentally blown, Games suggested that with a proper adhesive to trap the dust, they might be used as a cheap throw-away air filter. Up to this time, air filters were of the cleanable, permanent type. The throw-away Dust-Stop Filter gave new birth to the forced warm air furnace industry which has continued to grow and provide clean, warm air to thousands of homes.

Now, these coarse glass fibers were not suitable for thermal insulation. The wool was still coarse and brashy. After a series of inventions bearing the Slayter name, methods were devised for making a high-grade, lightweight, glass wool, the keystone to a wide variety of products today. In the old rock wool system, a steam blast was applied to a flowing stream, tearing it into a cascade of bits projected in comet-like formation. Slayter's concept was to flow a series of much finer streams and attenuate each to form individual fibers of of great length and fineness. He designed an electrically controlled platinum feeder, and an elongated steam blower to work together with extraordinary high efficiency. The spectacular use of wedding ring platinum at $35.00 an ounce (now $93.00), instead of refractory clay bought by the ton, seemed fantastic when Slayter first proposed it. But he sold the idea on its merits and achieved uninterrupted production at improved rates. Insulations for buildings, ships, trains, refrigerators, stoves, roof decks, tanks, ducts, and pipes are just some of the host of applications made by this process. More recently, a line of sound control boards and tile has emerged.

With the glass wool business well started, Slayter turned his attention to glass textiles. Crude glass cloth made of bundles of coarse glass filaments tied together with fine silk threads and even fashioned into a dress had found its way into museums, where it had rested for decades as a mere curio. The fabrics could not be folded without splitting, nor could the yarns be knotted without rupture. Slayter's concept was a machine for drawing a large number

of uniform, fine fibers, grouping them into a strand, and simultaneously coating them with a sizing material. The strands were drawn by spools whirling nearly two miles a minute. Out of these strands came a new miracle — one-hundred per cent glass cloth that could be folded without rupture. Electrical insulation, plastics reinforcement, and now, decorative fabrics, curtains, draperies that need no washing or ironing entice the public palate. At least five plants in this country, two of them licensees, and seven foreign plants utilize Slayter's basic glass textile inventions.

Not content with this achievement, Games Slayter conceived a super insulation devoid of all shot, feather light, highly compressible, and made of extremely fine fibers. A pound of textile strand stretched the equivalent mileage of New York to San Francisco or perhaps Honolulu. To accomplish his new aim it would be necessary to stretch a pound of glass the equivalent of the distance around the world at the equator. An entirely new method had to be devised. Slayter conceived the use of flame jetting from a burner onto small glass rods. He discovered phenomenal velocities imparted to the glass fibers — greater than thermodynamic principles appeared to justify. The outcome is now known as the Aerocor or superfine process used in five plants in this country, two of them licensees, and in at least four foreign countries. Superfine products are used for insulation of aircraft, automobiles, and a wide variety of miscellaneous uses. In compressed form, they make a highly resilient shock cushion. Coated with silicone, these gossamer filaments repel water and act as a rotproof, incombustible, buoyant material for life preservers and floats.

I have touched on only the most significant developments used in the factories of Owens-Corning and its licensees. Many of these products have opened up opportunities for hundreds of other companies. I shall mention a broad example which has been close to Games Slayter's heart for at least eighteen years. It is the concept of a new structural material formed by a matrix of low modulus of elasticity reinforced by a fibrous material of high modulus of elasticity. It was realized with Fiberglas-reinforced plastic. Properties of lightweight, high strength, dimensional stability and low die or mold cost, present opportunities for a wide variety of new products. Personal body armor for our combat troops protected by Fiberglas plastics has already saved lives, and other uses abound. Over forty companies make fishing rods; several companies are undertaking the production of custom-built automobile bodies. This industry is still but an infant. As new applica-

Dr. Slayter accepting the Ohio Award from Dr. Otis D. Cole, Chairman of the Ohio AIC Chapter.

tions come into being we can expect an ever-widening circle of opportunities, the creation of thousands of jobs, and a whole new horizon for industry.

So much for the moment for Dr. Slayter's technical achievements — though many more could be mentioned in fields of glass technology, metallurgy, segregation of seed, agriculture, combustion, prefabricated homes, electronics, and a host of others that have engaged his curiosity.

Inasmuch as THE AMERICAN INSTITUTE OF CHEMISTS has for one of its primary purposes the raising of professional standards, I should like to point out that under Games Slayter's direction the laboratories have been propagating beds of technical minds that have been nurtured and broadened along managerial and business lines to find their way into posts of leadership throughout the Company, not only in research, but in sales, manufacturing, and top management. Indeed, as may be expected with a pioneering company, a number of Fiberglas alumni have won key posts outside.

One of Games' valuable personal

traits is to consult with younger men, giving them guidance and encouragement, at times pointing out flaws and weaknesses to overcome, and thus building stature and respect in professional men. In fact, Games Slayter has been so closely allied with the development of the glass fiber business and its people that it is sometimes difficult to distinguish what he has done and what has been accomplished by the Fiberglas team which he has helped develop.

All of Games Slayter's associates feel heartily in accord with the recognition that THE AMERICAN INSTITUTE OF CHEMISTS is giving to their friend and colleague by the granting of the Ohio Award.

To quote our president, Harold Boeschenstein, on the occasion of our Annual Service Award Dinner, at which he presented Games Slayter with his twenty-year service award: "A man of ideas, vision and the ability to get things done. To me, he — Slayter — is Mr. Fiberglas!"

Honored: Dr. John Xan, F.A.I.C., head of the department of chemistry at Howard College, Birmingham, Alabama, who received the James Flack Norris Award at a dinner at Massachusetts Institute of Technology, Cambridge, Mass., May 14th. The citation reads, "Through his inspiring teaching over the past thirty years, he has stimulated students to extend themselves to the utmost of their ability and has led an unusually high proportion into graduate work in chemistry."

Dr. Xan was one of the principal founders of the research institute in Birmingham which has now grown into The Southern Research Institute. He is active on college committees, and has been one of the major policy makers of the faculty. He is a former chairman of the Alabama Section of the American Chemical Society and a national counselor. He is also a past president and treasurer of the Alabama Academy of Science and editor of the journal of the Academy.

Elected: As Honorary Member of the Association Francaise des Techniciens du Petrole, Paris, France, Dr. Gustav Egloff, Hon. AIC.

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Speakers at Annual Meeting Symposium on "Recent Advances in Medicinal Chemistry": J. J. Bunim, M.D.; L. B. Hobson, M.D., Ph.D.; J. M. Ruegsegger, M.D.; W. P. Boger, M.D., and L. E. Arnow, Ph.D., M.D.

The Present Status of the Therapy of the Collagen Diseases

Joseph J. Bunim, M.D.

Chief, Arthritis and Rheumatism Branch, National Institute of Arthritis and Metabolic Diseases, National Institutes of Health, Bethesda 14, *Maryland.*

(Abstract of a talk given at the Thirtieth Annual AIC Meeting, Philadelphia, Pa.)

THE term "collagen diseases" was born out of error and ignorance and has been retained in clinical medicine because of convenience and custom, despite our awareness and understanding of the incorrectness of the term. It is applied to a group of diseases that share in common a similar histo-pathological alteration in the ground substance of connective tissue. This alteration is recognized with the light microscope by certain staining characteristics. With specific dyes, the connective tissue in these

diseases appears like fibrin and hence is said to indicate "fibrinoid" alteration.

This similarity, however, should not imply identity because it is very probable that not all fibrinoid material in human tissue consists of identical chemical changes. Indeed the chemical nature of fibrinoid material has not been defined. The various collagen diseases may therefore differ widely from each other in cause, pathogenesis and mechanism and yet show in common a similar abnormality in the staining affinity of the ground substance present in the connective tissue. It is believed that the collagen fibers, as the chemist knows them, do not participate in these pathologic changes, yet the term "collagen diseases" has been retained.

This group of diseases consists of rheumatic fever, rheumatoid arthritis, disseminated lupus erythematosus, periarteritis nodosa, scleroderma, dermatomyositis and serum sickness. With the exception of the last disorder, the cause of each of these entities remains unknown. Many of these conditions respond initially to adrenal cortical hormones quite dramatically, yet in none of them has a deficiency of these hormones been demonstrated.

The diagnostic features, relative prevalence, natural course, accepted therapy, toxic effects of certain therapeutic agents, limitations and contra-indications of specific drugs were considered for rheumatic fever, rheumatoid arthritis and disseminated lupus erythematosus.

The Present Status of the Therapy of Tuberculosis

Lawrence B. Hobson, M.D., Ph.D.

Associate Medical Director, E. R. Squibb & Sons, Division of Mathieson Chemical Corp., 745 Fifth Ave., New York 22, N. Y.

(Abstract of a talk given at the Thirtieth Annual AIC Meeting, Philadelphia, Pa.)

THE chronic and destructive nature of pulmonary tuberculosis limits the results which can be expected from the most ideal antimicrobial therapy. It also complicates the interpretation of clinical results with various antimicrobial agents. The more acute miliary and meningeal tuberculosis offer an experimental tool but represent a comparatively small portion of the problem of tuberculosis.

With the existing antituberculous agents there are two difficulties clinically. Toxicity has limited the dosage of certain drugs. The appearance of tubercle bacilli resistant to the antituberculous agents has been

an even greater drawback. These two difficulties influence greatly the development of new antituberculous agents.

Streptomycin and dihydrostreptomycin are highly effective antituberculous drugs but both give rise to resistance and each can damage a portion of the eighth cranial nerve. Although the resistance is not altered, the simultaneous administration of half doses of streptomycin and dihydrostreptomycin material reduces the eighth nerve toxicity. The use of intermittent therapy, namely, administration only every third day, also decreases the risk of toxicity.

To prevent the emergence of resistant organisms to streptomycin, it is given concomitantly with another antituberculous agent such as p-aminosalicylic acid. p-Aminosalicylic acid often gives side effects; the amount of drug given can be reduced by using the renal blocking agent, probenicid.

Isoniazid also delays the appearance of organisms resistant to streptomycin. Although organisms resistant to isoniazid appear during therapy, their appearance also is delayed by streptomycin. Pyrazinamide is an effective and safe antituberculous agent whose chief drawback lies in a very rapid appearance of resistant bacilli. It is useful for tiding the patient over some particularly threatening situation. Viomycin is less effective and its usefulness is limited by its toxicity. Other antituberculous agents either have not been sufficiently evaluated or are too toxic for general use.

The Present Status of the Therapy of Acute Infectious Diseases

William P. Boger, M.D.

Medical Director, Sharp & Dohme, Medical Division, West Point, Pa.

(Abstract of a talk given at the Thirtieth Annual AIC Meeting, Philadelphia, Pa.)

THE literature covering the use of antibiotics in the treatment of bacterial infections is so tremendous as to defy comprehensive review. Notwithstanding, there is a need for reviews in an effort to overcome the confusion that exists with regard to the application of the multiple wonder drugs to the therapy of both the common and the severe infectious diseases. The various chemo-therapeutic agents are compared with regard to the quantities which are presently being manufactured and used and the lengths of time during which experience with the various agents has been accumulated.

The discriminating use of chemotherapeutic agents is needful because

of their profound effects upon both the pathogenic and nonpathogenic bacterial flora that constitutes the bacterial milieu in which man lives. No single agent is lethal for all microorganisms and, accordingly, the suppressive effect of an antibotic permits the overgrowth of the organisms not affected. This simple statement can be interpreted to mean that nature abhors a vacuum at the bacterial level quite as much as in other spheres of natural phenomena. As a result, we are seeing "new diseases" as a direct consequence of the therapeutic application of the presently available antibiotics.

At the laboratory level there have been clear demonstrations of additive, synergistic and antagonistic effects when chemotherapeutic agents are used in combination. In clinical experience it has been much more difficult to demonstrate the antagonistic effects, but here is good support of evidence of additive, and perhaps synergistic effects. Hence, certain combinations of useful agents are now clearly indicated and an incomplete summary of such beneficial combinations is presented.

An effort will be made to clarify the dosage schedules, the applications and the routes of administration of the various available antibiotics.

Presented: The Service Award of Illinois Institute of Technology to Robert I. Wishnick, F.A.I.C., president of Witco Chemical Co., and a trustee of IIT. He is a founder of the Alumni Fund, serves on the Special Gift Committee of the Fund, and as alumni counselor on the New Student program.

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Honorary Degree: Awarded to Frank G. Breyer, Hon. AIC, by Clarkson College of Technology, Potsdam, N. Y., May 31st. He is a partner of Singmaster and Breyer, metallurgists and chemical engineers of New York, N. Y., a firm of which he was one of the founders in 1927. He received the B.S. degree in 1908 and the M.S. degree in 1910 from John Hopkins University. He received the second Honor Scroll of the New York Chapter in 1950.

Planned: Construction of a plant to manufacture para-xylene by Standard Oil Company (Indiana) at Whiting, Ind., for operation in January, 1955.

Emotions — The Main Intangible

C. C. Brumbaugh

Director, Research and Development, Diamond Alkali Company, P.O. Box 348, Painesville, Ohio

(Abstract of a talk presented at Session A, "The Intangibles Which Surround Research Administration," during the Thirtieth AIC Annual Meeting in Philadelphia, Pa.)

ALL professions have in common the one main intangible — a wide variation in human beings and the way they behave. This poses a quite intangible problem to the research scientist who is accustomed to working with concrete facts and experimental results. The main objective of the scientist efforts is to improve the well-being of people and he is at a loss at times to correlate the organized knowledge of science with the variability in human emotions.

It is difficult to realize that the best organization of facts may be meaningless in the face of conflicting human emotions. The organized body of knowledge of the sciences is constantly growing, developing new technology, and improving the material things of life. On the other hand, the fundamental human emotions haven't changed in two thousand years and probably won't change in the next two thousand years. There results an intangible gap between human relations and science that is difficult to bridge. A realization that human emotions are fundamental and controlling would help all of us, including the research worker, to make better contributions to social progress.

The research scientist senses some veiled criticism of the rapid technological progress that has been made during the past hundred years, and that he has caused complications in our human relationships. The research scientist is prone to ask what contributions other professions have made in this field of human relations and to wonder where the lawyers, the ministers, the economists, and the educators and others have been while this amazing technical progress has been achieved. Possibly the scientist has set a fast pace, but this is no reason for him to slow down or abandon his efforts.

The business of research is to develop facts and experimental evidence. The objective is to communicate these facts to others for the well-being of people, even though at times this broad objective is somewhat obscure. There is some question that the classical communication system used in business and even between nations simply complicates the ex-

change of desirable information and contacts. The system whereby the communications are passed through a complicated chain of authority, and where by-passing is strictly prohibited, simply exposes the communication to that many more human emotions. A simple direct contact between individuals concerned with the information has merit worth considering. This is particularly true in a society where the individual has freedom of choice regarding his actions, and is not subject to rigid authority. The one qualification to a cross-communication system of handling information is that once a decision or definite plan of action is decided upon, then this decision should be promptly passed up and down the chain of authority.

The main intangible of research administration is how this communication of facts can be done in such a way that the facts are understood by people so that social progress can be brought along equally with material progress.

The Relationship of Research Laboratories to Other Departments

W. A. LaLande, Jr. F.A.I.C.

Manager, Research and Development, Pennsylvania Salt Manufacturing Company, Box 4388, *Chestnut Hill P.O., Philadelphia* 18, *Pa.*

(Abstract of a talk presented at Session A, "The Intangibles Which Surround Research Administration," during the Thirtieth AIC Annual Meeting in Philadelphia, Pa.)

THE evolution of an organized, departmentalized research and development division from a group of individuals performing both technical and related non-technical functions must necessarily parallel the growth and diversification of the parent company. Efficient operation may indicate relinquishing some of the non-technical operating functions to other company divisions or even the formation of autonomous departments to handle particular phases of technical activity. In such cases, the closest cooperation and collaboration between research and development and such separate departments (accounting, finance, purchasing, market research, sales service, engineering, etc.) is essential. Generally, however, it is believed that efficient team operation of a research and development division requires that research, product evaluation and development, technical service, process engineering, large scale sample preparation, pilot plant design and operation, library facilities and the patent department remain under the control of research and development management.

Employee Morale

R. F. Brown

General Manager of Research and Development, Spencer Chemical Company, 610 Dwight Building, Kansas City 6, Missouri

(Abstract of a talk presented at Session A, "The Intangibles Which Surround Research Administration," during the Thirtieth AIC Annual Meeting in Philadelphia, Pa.)

EMPLOYEE morale obviously constitutes one of the major intangibles in the overall administration of research activities. The speaker deals specifically with one phase of this field of morale which pertains to the transition of a research project from the idea stage to that around which a specific program is developed.

It is the practice of his company to allow selected individuals substantial freedom in their activities within the department because they have demonstrated the unique ability of originality in their thinking. However, these men in practically all cases are not capable of organizing a course of action to convert their ideas into practical applications. Since one of the primary objectives of a Research Department is to transform money spent for research into profitable sales it becomes necessary to wean the work away from the idea men at a relatively early stage. This can, of course, create some problems in employee morale.

Attempts to alleviate this condition by providing these idea men with (a) greater freedom, (b) increases in salary, (c) publicity where possible, (d) promotion without increase in administrative duties, (e) etc., have been made by many companies with varying degrees of success. The speaker recommends the use of all these approaches but points out that the final perfect solution has not yet been found.

Elected: Dr. Emil Ott, F.A.I.C., director of research, Hercules Powder Company, as president of the American Section of the Societe de Chimie Industrielle. The parent society sponsored the 26th International Congress of Industrial Chemistry in Paris in June.

Born in April: The American Chemical Society's new publication, the *Journal of Agricultural and Food Chemistry*. Dr. Walter J. Murphy, Hon. AIC, editor, declared that "close teamwork among scientists and technologists in many fields is needed to provide enough food for the world's growing population. It has become increasingly obvious that there is a common bond among the scientists who study agronomy, entomology, food processing, nutrition, and the other sciences involved in feeding the world. That common bond is chemistry." The journal provides a common meeting ground for all the scientists and technologists concerned with food, clothing, shelter, and industrial products from agriculture. Dr. Richard L. Kenyon, F.A.I.C., is managing editor of the new journal and James M. Crowe, F.A.I.C., is executive editor.

Technical Director: Paul N. Cheremisinoff, M.A.I.C., of Joseph Turner & Co., and its Crown Chemical Company Division, Ridgefield, N. J. He was formerly with the research department of Swan-Finch Oil Corp., Hackensack, N. J.

Transferred: Harry Burrell, F.A.I.C., by Interchemical Corporation, from Newark, N. J. to its Finishes Division at 1754 Dana Avenue, Cincinnati 7, Ohio. Dr. J. B. Allison, F.A.I.C., succeeded him as chairman of the New Jersey AIC Chapter.

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Featured: In the Denver, Colorado, *Post*: Dr. Alfred C. (Pete) Nelson, F.A.I.C., as "The Affable 'Mr. Chips' of Denver University." He has been associated with the university for thirty-six years, first as student, then as instructor, assistant professor, professor, registrar, dean of the graduate college, summer school director, research board executive secretary, and chancellor. He is now, at the age of fifty-four, dean of the Denver University community college, where 2,500 students attend adult education classes.

Appointed: Dr. Hal G. Johnson, F.A.I.C., as director of research and development of Monsanto Chemical Company's Western Division, Santa Clara, California. He was formerly assistant director of the company's General Development Department at St. Louis, Missouri.

Opened: By Chas. Pfizer & Co., Inc., of Brooklyn, N. Y., an experimental farm near Terre Haute, Ind., for animal nutrition and veterinary medicine research.

Report of the President

Dr. Lincoln T. Work, F.A.I.C.

President, The American Institute of Chemists, Inc.

(Presented at the AIC Annual Meeting)

FOR professional workers in chemistry, whether they be in the field of that name, in chemical engineering, or in related fields which utilize that science, THE AMERICAN INSTITUTE OF CHEMISTS stands as your professional association. Having but recently passed the quarter century of its existence and having a membership of over 2,500, it is an organization strong and ready to serve these professional needs, whatever they may be. It has arrived at a point in its growth, where in order to look forward, it needs to increase its service whenever chemistry is practiced. To that end, the activities of this administration have been directed; national functions are being carried out for this goal; chapter activities are being encouraged and stimulated; and the responsibility of the individual is being emphasized. There is room for such growth and it remains for each and everyone to do his part for it.

The past year has shown progress toward the larger objective; and momentum is being created for achievement still to come. Perhaps the examples of our work will read prosaically, though their bearing on the goal should be evident.

Constitution and By-Laws. A major revision has been needed for some time. The rules need to be streamlined and some new practices need to be spelled out, yet the INSTITUTE needs no basic change. A committee under the chairmanship of Benjamin Sweedler (F.A.I.C.) has done some effective work on the basic structure of these documents. There are a few points which need enlarged debate and clarification before their work is given to the membership for its comment and criticism. The fullest opportunity will be given for study before action is asked.

Laws. The INSTITUTE has watched the trend of legislative debate on broadening the base of Social Security and awaits the recommendations of the present Administration in Washington.

The Chemist. A controlling element in the effectiveness of this journal is the scope of its advertising which, though growing, has been small. The members of the Society who have given their support in recent efforts are to be thanked for the help which they have given. Readers of THE CHEMIST can see the results by comparing succeeding issues in the past year. The editorial aspect of THE CHEMIST has shown growing

strength; and, as plans develop, THE CHEMIST should increase in usefulness.

Membership. The committee organized under the chairmanship of Mr. John Nair, F.A.I.C., has been arranging its procedures and establishing its points of contact to reach across the country to those who should be members. There has been much work done in preparing new literature, less cumbersome data forms, and lists submitted by the chapters and many other sources. Results are showing now; but the real effect of this effort will be felt in increasing degree during next year. In the personalized basis the committee employs, the Chapters can be of immeasurable help.

Some who have been members had let their membership lapse through non-payment of dues. Last December, your President wrote to each of them, asking them as members who had lost interest, to tell him what they had hoped for and expected of the INSTITUTE. The responses were enlightening; but best of all as they formulated their thoughts, many decided to stay with us.

Employer-Employee Relations. This committee was appointed somewhat later than the others. Under the chairmanship of Dr. George L. Royer, F.A.I.C., plans are being made for some basic activity on the part of the committee.

The subject of contracts came to the fore through activities of the Chicago Chapter which culminated in a very stimulating and instructive meeting.

The professional aspects of the dismissal of Dr. Astin as Director of the National Bureau of Standards has created a very disturbing situation, particularly among those who have given their lives in the service of government. It was at once discussed in Council, with the result that your President stated that he would communicate directly with President Eisenhower and that a committee under Dr. M. L. Crossley would study the matter and make recommendations for the current Council meeting. The restoration of Dr. Astin to his position until a committee of eminent scientists can study and report on proper Bureau functions is in keeping with the recommendations made to the White House.

Manpower. A committee under Dr. D. B. Keyes, F.A.I.C., has been watching the efforts in Washington to develop procedures for handling technical manpower in an effective relation with both civilian and military efforts.

Chapter Activities. The effective performance of each chapter is a matter of major concern to the INSTITUTE. Local and individual problems are best studied at that level, leaving the basic principles behind individual cases for national

consideration. Your President has made it a point to meet with Chapter Councils and to discuss with them the manner in which Chapter and National groups can best work together for the INSTITUTE. The INSTITUTE can serve the Chapters through manuals to disseminate routine procedures and ideas for activities and through greater financial support. Consideration of these is in process. Many of the Chapters have special projects which serve as a local stimulus and which in many cases will broaden to national scope. In general, chapter activities are effective in the larger cities. It becomes more difficult in the areas of limited concentration of chemists, where distances to meeting places are too great. The national organization may wish to sponsor some activity for those too far from the chapter meetings. An alternative solution, proven in the Ohio Chapter, is to have local area representatives who serve as nuclei for small groups to gather and for attention to local problems. Time will tell how best to enhance the value of the Chapters, and efforts will be continued with them to find ways to attain their best effectiveness.

Honor Awards. One of the more publicized services of the INSTITUTE resides in its various honor awards. Your President has been happy to present honorary membership to the three worthy recipients this year:

Dr. Glenn T. Seaborg—September 25, 1952, at Los Angeles.

Dr. Sidney Kirkpatrick—October 9, 1952, at New York.

Dr. R. Lindley Murray—February 4, 1952, at Niagara Falls.

In addition, he has visited eight chapters in connection with local chapter awards. The INSTITUTE has been represented officially on ten occasions by your President or by his appointed representative. The breakfast at the A.C.S. meeting in Atlantic City, Sepember 16, 1952, sponsored by the Pennsylvania Chapter, and the luncheon at the Los Angeles meeting, March 17, 1953, sponsored by the local chapter, were both successful affairs.

Our work is still unfinished; and the year ahead should see further progress along the lines in which the INSTITUTE's efforts are directed.

Announced: By Dr. Earl L. Whitford, F.A.I.C., president of Oldbury Electro-Chemical Company, Niagara Falls, N. Y., the promotion of four members of the staff to office of vice president: Dr. C. A. Stiegman, F.A.I.C., as vice president and technical director; M. L. Parker as vice president in charge of production; Harold L. Townend as vice president in charge of engineering, and N. Harold Fyffe, F.A.I.C., as vice president in charge of sales.

Report of Committee on National Legislation Affecting Chemists

(Presented at the AIC Annual Meeting)

Export and Import Control Act

Congressman Gross (Iowa) introduced a bill (H.R. 2949) on February 12, 1953, to amend the Export Control Act of 1949, which would then become known as the "Export and Import Control Act, 1953."

Export controls have been in continuous force since the beginning of World War II, but this bill if enacted would establish the first broad control over imports, at least in recent times. The stated purpose of import control is "to protect the domestic economy from excessive imports of commodities which are in surplus supply in the domestic market." The purpose in continuing export control is "to protect the domestic economy from the excessive drain of scarce commodities and to reduce the inflationary impact of abnormal foreign demand." As presently authorized, export control also operates to safeguard the security of the U.S. and to aid in carrying out national policy. Import control as envisaged by this bill obviously is protectionist by design and therefore would serve in much the same way as a tariff for protection.

Committee on Science

Congressman Hinshaw (Califora) on February 3, 1953, introduced a joint resolution (H.J. Res. 166), the purpose of which is to establish a joint Senate-House Committee on Science. The committee would be comprised of seven appointed members from each body, plus volunteers from the same sources.

This committee would have the scholastic duty of keeping itself informed on the "results of scientific research and technical development which bear upon public affairs, and the problems being encountered in maintaining in the United States a scientific and technical effort of outstanding quality and accomplishment." The studies of which the committee would devote itself will enable it to weigh the "impact of science upon public affairs," which is interpreted broadly as covering the nation's resources in flesh and materials, its foreign and domestic commerce, foreign relations, internal security, health, prosperity, and welfare. The committee is required to maintain liaison with the National Science Foundation and is authorized to use freely whatever resources the Foundation has as well as resources of other branches of the government. The assistance of private parties is also in order. This bill, since its aim is to develop enlightened congres-

sional thinking in the ways and hopes of science, would seem to strengthen the scientist's position as a useful citizen and a benefactor.

Desalting of Sea Water

Passed by the 82nd Congress was a bill authorizing expenditure of $2,000,000 to transform sea water into fresh water. The law provides for research to be conducted by institutions already in the field instead of establishing new government laboratories. Historically, the Bureau of Reclamation, Department of the Interior, has sought to store water from rainfall run-off, rivers, and melting snows. That Bureau is charged with responsibility for supervising the research program authorized, the actual work being done at engineering colleges or similar institutions. A modest sum ($100,000) has been appropriated for the purpose. A number of possible approaches to desalt sea water are known but in most cases at prohibitive cost for large-scale operations. Because of the almost universal need for greater quantities of fresh water and the obvious benefits of a practicable solution, much interest is being shown in this project.

Weather Modification

Senator Case (S. Dakota) introduced a bill last year dealing with "rain-making." The bill passed the Senate but got no further. On January 9, 1953, he re-introduced a similar measure (S. 285). The bill would set up an interagency commission comprising the Secretaries of Defense, Agriculture, Commerce, and Interior, plus 5 members appointed by the President. The bill provides for this commission to direct the licensing and control of experimenters who engage in making rain.

The technical problem here is to cause the mist in clouds to coalesce into droplets which in turn form drops of sufficient magnitude to fall. Aside from obvious civilian applications in dry areas, this process has military usefulness through the creation of muddy terrain for enemy forces. Of course, clouds are a prerequisite.

Retirement Benefits for the Self-Employed

Pending in the House are two identical bills (H.R. 10 — Jenkins, H.R. 11 — Keogh) that provide for retirement benefits for the self-employed. These bills take the place of similar (Reed, Keogh) bills entered in, but not passed by, the preceding Congress. No particular occupations or professions are mentioned in the bills but lawyers, doctors, chemists, etc. come within their scope.

The Social Security Law, as amended in 1950, excluded self-employed professional engineers from the benefits of the law. By a ruling of the Deputy Commissioner of Internal Revenue "professional engineer" is interpreted to include self-employed chemists. The Jenkins-Keogh bills would enable self-em-

ployed chemists to qualify for retirement benefits. (See THE CHEMIST, Nov. 1952, page 565, and *Trusts and Estates Magazine*, Nov. 1952 for views on the proposed legislation.)

National Science Foundation

The National Science Foundation operated in 1952 on a $3.5 million budget although $15 million had been asked. The following table shows a breakdown of the Foundation's main expenditures for 1951 and 1952 with estimates for 1953 and the amounts asked for 1954. Item I refers to a "National Policy for Promotion of Basic Research and Education in the Sciences." The second item is "To Support Basic Science Research and To Appraise the Impact of Research Upon Industrial Development and General Welfare and to support Specific Defense Activities at the request of the Secretary of Defense." The third item includes the Awarding of Scholarships, Graduate Fellowships, the Exchange of Scientific Information and the Maintenance of a Register of Scientific and Technical Personnel.

These figures indicate a healthy growth, but even so the Foundation's sponsorship of basic federal research in 1952 amount to only about 1½ percent of total federal appropriation for basic research. It may be expected that time will substantially increase this percentage.

Synthetic Fuels

No bills were passed by the 82nd Congress, which appropriated no more funds for the Bureau of Mines research on synthetic fuels. The Bureau is still working on funds appropriated by the 81st Congress, which provided a total of $87,600,000 and extended the synthetic fuels research program to April 1955. A bill failed

Breakdown of National Science Foundation Main Expenditures

	Actual 1951	Actual 1952	Estimate 1953	Asking 1954
1. Development of U.S. Policy	$ 75,463	$ 559,110	$1,175,000	$ 1,584,000
2. Research Support ..	53,472	1,243,651	2,120,000	8,878,000
3. Scientific Manpower and Education ..	21,993	1,663,239	1,489,000	4,574,000
TOTAL	$150,928	$3,466,000	$4,784,000	$15,036,000

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of passage in the 81st Congress, which would have appropriated $650,000,000 for Government-subsidized synthetic fuel plants. The Secretary of the Interior in 1952 continued to stress the need for synthetic fuels research in anticipation of future needs in case of diminishing petroleum supplies and suggested appropriations of $400,000,000 to support the work.

Congressional Enactments

The following actions, in addition to those mentioned elsewhere in this report, were taken by the 82nd Congress:

Atomic Energy Commission

Public Law 137, entitled the Independent Offices Appropriation Act for 1952, awarded the Atomic Energy Commission $1,139,932,750 for salaries and expenses.

Public Law 253, a supplemental Appropriation Act, awarded the Atomic Energy Commission an additional $265,965,000.

Public Law 254, a second supplemental Appropriation Act, awarded the Atomic Energy Commission another $200,000,000 for salaries and expenses.

Defense Departments

Public Law 403 awarded the National Advisory Committee for Aeronautics $13,108,000 for construction of a pressure tunnel and high temperature structural research laboratories and also $6,592,000 for jet engine research.

Public Law 488, the Department of Defense Appropriation Act for 1953, awarded $440,000,000 for Army research and development and $70,000,000 for Navy research.

The following tabulation summarizes the appropriations made for Governmental research in the Atomic Energy Commission and Defense Departments.

Atomic Energy Commission	$1,605,897,750
Army	440,000,000
Navy	70,000,000
TOTAL	$2,115,897,750

It is estimated that the total research expenditures in the United States are about $3.5 billion annually. On this basis the above appropriations are approximately 60% of all monies that are being spent for research.

Public Law 557 provides for the establishment of advisory committees or panels "To Facilitate the Performance of Research and Development work by and on behalf of the Department of the Army, the Navy and the Air Force and for other purposes."

Public Law 593 was passed "To revise and codify the laws relating to patents and the patent office and to enact into law Title 35 of the United States code entitled 'Patents'."

An important feature of the revised patent laws is that they no longer emphasize the necessity for the "Flash of Genius" for establishing

patentability, but acknowledge that patentable processes and products may be developed by long cooperative research and development.

—L. N. MARKWOOD, *Chairman*
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DR. EDUARD FARBER
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Something New

"Plantman Sweepers, New Models," illustrated brochure. Room 254, Handling Devices Co., Inc., 43-45 Pearl St., Brookline 46, Mass.

"Lustrex X-820," a carboxyl-containing polyelectrolyte resin. Data sheet. Monsanto Chemical Co., Springfield, Mass.

"Carbowax Polyethylene Glycols." Book. Carbide and Carbon Chemicals Co., 30 East 42nd St., New York 17, N. Y.

"Formic Acid". Technical Bulletin. Heyden Chemical Corp., 342 Madison Ave., New York, N. Y.

"Fatty Acids". Booklet. Fatty Acid Division, Association of American Soap and Glycerine Producers, Inc., 295 Madison Ave., New York 17, N. Y.

"New Pressure Relief Valve." Information. Pantex Manufacturing Co., Pawtucket, R. I.

"Constant Temperature Baths." Booklet. Fisher Scientific Co., 717 Forbes St., Pittsburgh 19, Pa.

"Stucco Finishes Made With Pliolite S-5." Booklet. Chemical Division, Goodyear Tire and Rubber Co., Akron 16, Ohio.

"Air Pollution Abatement Manual." Manual Sheet P-7. $0.75. Manufacturing Chemists Association, Inc., 246 Woodward Bldg., Washington 5, D.C.

"Glas-Weld," adhesive for silicone-treated surfaces. Information. Polymer Industries Inc., 1108 30th Ave., Astoria, N. Y.

"CMC," washing and sizing aid. Information. Hercules Powder Co., Wilmington, Del.

"Model 112 Infrared Spectrometer." Bulletin 1002. Perkin-Elmer Corp., Norwalk, Conn.

"Laboratory Chemicals." Partial addition to 1952 price list. Eastern Chemical Corp. 34 Spring St., Newark 4, N. J.

"Ipco Beacon Flashing Bulletin Board." Information. Industrial Products Co., 2687 N. Fourth St., Philadelphia 33, Pa.

"The True Mass Rate Flowmeter." Descriptive sheet. Control Engineering Corp. 560 Providence Highway, Norwood, Mass.

"The Laboratory, Vol. 22." Publication. Fisher Scientific Co. 717 Forbes St., Pittsburgh 19, Pa.

"Photoelectric Densitometer Model 525 for Chromatography." Bulletin No. 800. Photovolt Corp., 95 Madison Ave., New York 16, N. Y.

"Continuous Microfilm Enlargement Service." Booklet No. BDS-3 Rev. 1, Remington Rand, Inc., 315 Fourth Ave., New York 10, N. Y.

"Eye Protection." Catalog. Kimball Safety Products Co., 9310 Wade Park Ave., Cleveland 6, Ohio.

"How Conditioning Efficiency Increases Flotation Recovery." Bulletin. Denver Equipment Co., 1400-17th St., Denver, Colo.

"Promatic Electronic Timer." Information. General Control Co., Boston 34, Mass.

COUNCIL

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Albin Warth, *Baltimore Chapter*

May Meeting

The 289th meeting of the National Council of The American Institute of Chemists was held, May 11, 1953, at 6:15 p.m., in the Benjamin Franklin Hotel, Philadelphia, Pa. President L. T. Work presided. In the absence of the secretary, Florence E. Wall was appointed secretary *pro tem.*

The following officers and councilors were present: C. C. Concannon, L. H. Flett, F. A. Hessel, H. O. Kauffmann, M. J. Kelley, D. B. Keyes, J. H. Nair, H. A. Neville, M. Sittenfield, F. D. Snell, R. Stevens, F. E. Wall, L. T. Work. T. R. Bewley, chairman of the Los Angeles Chapter, Dr. O. D. Cole, chairman of the Ohio Chapter, Dr. A. W. Fisher, Jr., chairman of the New England Chapter, H. Robinette, in charge of special events for the Annual Meeting, K. M. Herstein, chairman of the New York Chapter, D. W. Young, alternate for the New Jersey Chapter Councilor, and V. F. Kimball were present.

President Work presented his Annual Report.

The Secretary reported that we now have 2506 members in the INSTITUTE. She announced with deep regret the death of: John Gaub, Charter Member, Mar. 9, 1953, and Dr. Edwin R. Theis, F.A.I.C., Apr. 25, 1953.

The following resolution was adopted:

Resolution

Whereas, We, the Council of The

American Institute of Chemists, have learned with profound sorrow of the death, on March 20, 1953, of our colleague,

James Renwick Withrow

and

Whereas, Dr. Withrow, as a Fellow of The American Institute of Chemists, was deeply interested in the Institute, having served as Councilor from 1945 to 1951, and as Chairman of the Committee on Professional Education for several years, and has served on the Executive Committee of the Ohio Chapter since its inception; and

Whereas, he, in the true spirit of The American Institute of Chemists has always worked for the betterment of the profession through more than a half-century of teaching, guidance, and continued interest in his students, and by holding many responsible positions in professional organizations, both national and international; and

Whereas, in his personal life he never compromised his principles, but always maintained the highest moral, intellectual and ethical motives, and insisted upon the highest standards in scholarship and ideals, and believed that careless thinking and wasting time were unforgivable sins, so that the impact of his influence has brought deep respect for the chemical profession, and

Whereas, his international reputation as an educator, chemist and chemical engineer resulting from his many professional accomplishments, as well as his constant attendance and interest in the affairs of professional and civic organizations made him an esteemed, respected, inspiring, and strong leader in the profession;

Therefore, Be It Resolved, that this Council hereby record its recognition and high esteem of this outstanding Fellow of The American Institute of Chemists, its deep sense of loss, and its sincere sympathy to his family; and that a copy of the resolution be spread on the minutes of the Council and a copy be sent to his family.

Mr. Nair reported for the Committee on Membership that the Chapters are actively cooperating with this committee.

Dr. Donald B. Keyes reported as chairman of the Committee on Manpower. Two recent bills H.R. 3893 and S. 1551 propose to set up a Presidential Board to handle the scientific manpower situation. The Council went on record as supporting the principle behind these bills — i.e. that a Presidential Board be created to handle the scientific manpower situation. President Work was asked to so notify Hon. Charles E. Wilson.

Dr. Snell presented the report of the special Committee to Consider the Situation at the Bureau of Standards.

Dr. Kauffmann reported that the Niagara Chapter had held five meetings during the year. Much public interest was shown in the talk given by R. Lindley Murray when he received Honorary AIC Membership.

Mr. Bewley reported that the "Western Chapter" had held five eminently successful meetings. He requested closer liaison between the Chapter and the national organization so that the Chapters would know as early as possible what kind of dynamic action is being taken on current matters.

President Work suggested that, with a copy of the minutes sent to Councilors, should go a copy of the financial report, reports of the Committees, news of current matters. The Editor was asked to prepare such an "Activities Report," and send it to Councilors and Chapter chairman once each month between CHEMISTS.

Dr. Cole stated that the Ohio Chapter successfully operated through district directors in the states of Ohio, Kentucky, and Tennessee. These directors supervise and make contacts.

Mr. Concannon reported that the Washintgon Chapter's recent meeting was an outstandingly successful affair, when Dr. Arno C. Fieldner received the Chapter's Honor Scroll. (See May CHEMIST.)

Mr. Stevens reported that the New England Chapter plans a novel meeting in cooperation with another group.

The New Jersey Chapter, Mr. Young announced, plans a survey of the chemists' place in the community.

Dr. Kelley announced that the New York Chapter's Honor Scroll would be

presented to Dr. Herman Mark, on May 21st.

Mr. Herstein added that the New York Chapter had evolved a plan to interest younger members in the work of the AIC, by inviting them in groups to attend meetings of the Chapter's Council.

Mr. Sittenfield welcomed the Councilors to Philadelphia, as chairman of the Committee on Arrangements for the Annual Meeting.

A supplementary meeting of the National Council was then called for May 13th at the Benjamin Franklin Hotel, at 8:00 a.m.

At the Breakfast meeting on May 13th, resolutions of thanks were extended to those who contributed to the success of this Annual Meeting, including the Industrial Toxicology Laboratories which sponsored the Social Hour; Fisher Scientific Company which gave the reception to the medalist; the Panel Leaders of the various sessions; those who took part in the program; the local Philadelphia Committee for Arrangements, Special Events, and other services; Charles E. Peterson, who spoke on the historical restoration of Philadelphia at the Informal Luncheon, and the Honorary Chairmen of the Annual Meeting.

President Work discussed Committee Personnel for the coming year, and was given authority to appoint committees along the lines suggested.

The following new members were elected at the May 11th meeting:

FELLOWS

Benton, Francis Lee
Research Chemist, Research Department, Armour Laboratories, 1425 West 42nd Street, Chicago, Ill.

Bossinger, Charles D.
Research Chemist, Armour Research Laboratories, 1425 West 42nd Street, Chicago, Ill.

Cantor, Sidney M.
Consulting Chemist, 25 Rolling Road, Overbrook Hills, Philadelphia 31, Pa.

Carrigan, Richard Alfred
Supervisor, Armour Research Foundation of Illinois Institute of Technology, 35 West 33rd Street, Chicago, Ill.

Cocozza, Eugene P .
Chemist, Mundet Cork Corporation, 71-01 Tonnelle Avenue, North Bergen, N. J.

Crippen, Raymond C.
Own Consulting Laboratory, Raymond C. Crippen Research & Development Laboratories, 1138 East North Avenue, Baltimore 2, Md.

Davidson, Glenn M.
General Sales Manager, The Glidden Company, Soya Products Division, 1825 North Laramie Avenue, Chicago, Ill.

Fein, S. Steven
Head, Vegetable Oil Production Department, Kraft Foods Company, 500 North Peshtigo Court, Chicago, Ill.

Gothard, Nelson J.
Chief Chemist, Sinclair Refining Company, 400 East Sibley, Boulevard, Harvey, Ill.

Hunt, Mildred Carolyn
Technical Librarian, Sugar Research Foundation, 52 Wall Street, New York 5, N. Y.

Johnson, Harry E.
Executive Vice President, Triangle Chemical Company, Box 259, Foot of Elm Street, Macon, Ga.

Kehoe, Thomas Joseph
Associate—Consulting-Industrial Waste Treatment, Pomeroy & Associates, 660 South Fair Oaks, Pasadena, Calif.

King, George J.
Director of Sales, Atlas Powder Company, Wilmington, Del.

Kosak, Alvin I.
Assistant Professor, New York University, 477 First Avenue, New York 16, N. Y.

Lobo, Walter E.
Director, Chemical Engineering Division, The M. W. Kellogg Company, 225 Broadway, New York 7, N. Y.

Longenecker, Herbert E.
Dean of Research, University of Pittsburgh, Pittsburgh 13, Pa.

Lycan, William H.
Director of Research & Vice President, Johnson & Johnson, George Street, New Brunswick, N. J.

Marvinny, John J., Jr.
Chief Chemist, Frank B. Ross Co., Inc., 6 Ash Street, Jersey City 4, N. J.

May, Alvin Edwin
Assistant to the President, Truesdail Laboratories, Inc., 4101 North Figueroa Street, Los Angeles 65, Calif.

Morgan, George S.
Own Laboratory, Morgan Laboratories, 415 Michigan Street, Toledo 2, Ohio.

Odeen, Henry
President, H. Odeen Company, Inc., Box 4845 North Station, Memphis, Tenn.

Pearce, Howard R.
Vice President, Sales, The Matheson Company, Inc., East Rutherford, N. J.

Reasenberg, Julian Robert
Director of Research, Mizzy Inc., 304 East 23rd Street, New York 10, N. Y.

Sanford, Theodore Dale
F. E. Booth Company, San Francisco, Calif.

Schadt, Kenneth
Chemist, Arthur C. Trask Company, 4103 South La Salle Street, Chicago 9, Ill.

Segel, Edward
Head, Protein Research Division, Darling & Company, 4201 South Ashland Avenue, Chicago, Ill.

Selin, Helm
Chemist, Griffith Laboratories, 1415 West 37th Street, Chicago 9, Ill.

Shapiro, Abraham
Chemical Engineer, General Petroleum Corporation, Los Angeles, Calif.

Shur, E. G.
Supervisor, Interchemical Corporation, 800 Magnolia Avenue, Elizabeth, N. J.

Singer, John J.
Bersworth Chemical Company, 875 Waverly Street, Framingham, Mass.

Speel, Henry Charles
Private Consultant, Box 1155, Wyandotte, Mich.

Sunde, Conrad J.
Research Director, N. I. Malmstrom & Company, 147 Lombardy Street, Brooklyn 22, N. Y.

Terry, Daniel Hetfield
Director of Research, Bon Ami Company, 21 West Street, New York 6, N. Y.

Turney, Lawrence J.
Research Director, H. W. Madison Company, 2850 Euclid Avenue, Cleveland, O.

Twiss, Sumner B.
Head, Physical Chemical Research Department, Chrysler Corporation, Engineering Division, Box 1118, Detroit 31, Mich.

Weiner, Arnold M.
Chief Chemist, Dubuque Packing Company, Dubuque, Iowa.

MEMBERS

Arthur, Ralph Petlow
Research Chemist, Armour & Company, 1425 West 42nd Street, Chicago, Ill.

Cook, Hurley Dean
Chemist, Research Department, Standard Oil Company (Ind.), Whiting, Ind.

Grand, Stanley
Research Chemist, Calco Chemical Division, American Cyanamid Co., Bound Brook, N. J.

Herr, Ross Robert
Group Leader, The Armour Laboratories, 1425 West 42nd Street, Chicago, Ill.

Senter, Tryee A.
Plant Superintendent, Delta Chemical Company, 682 South Cox, Memphis, Tenn.

Sullivan, Vincent A., Jr.
Director of Research, Stepan Chemical Company, 3250 South Kedzie Avenue, Chicago 23, Ill.

Talbott, William Harry
Chief Chemist, Keldon Research Corporation, 2565 Belgrave Avenue, Huntington Park, Calif.

Thomas, Seymour
Technical Sales Service Representative, Braun Corporation, 2260 East 15th Street, Los Angeles 21, Calif.

Veis, Arthur
Chemist, Armour & Company, Chicago 9, Ill.

Ziegenhorn, George J.
Chemical Engineer, Podbielniak, Inc., 341 East Ohio Street, Chicago, Ill.

ASSOCIATE

Gross, Joseph Francis
Sr. Chemical Engineer Student, Pratt Institute, 195 Grand Avenue, Brooklyn 5, N. Y.

REINSTATED TO MEMBER

Massenberg, Sylvia
Associate Chemist, Armour Research Foundation, 35 West 33rd Street, Chicago 16, Ill.

AIC Activities

C. P. Neidig, F.A.I.C.

Baltimore Chapter

Chairman, Ralph Lamenzo
Vice Chairman, Dr. Leonard Rice
Secretary-Treasurer, J. Bernard Edmonds, 3816 Greenmount Ave., Baltimore 18, Maryland
Representative to National Council, Dr. Albin H. Warth

Mercaptans Discussed

On May 28th, in a private dining room at The Marylander, the officers listed above were elected for 1953-1954.

Dr. E. Emmet Reid, Hon. AIC, gave an interesting talk on the development and growth of organic sulphur compounds. In 1904 Remsen said that mercaptans were analogues of alcohols, and stopped there. At that time there was little in the literature about these compounds and Dr. Reid became interested in them and prepared several pounds of the various mercaptans, which, he said, "really do not smell bad at all!" Several choice anecdotes concerning the small beginning of The Chemical Warfare Service and his part in the search for suitable poison gases in World War I were told. At present there is so much work being done on and with these sulphur compounds that it is difficult to keep up with the expanding literature. Some little known relationships between the properties of the mercaptans and the alcohols were discussed.

—Edward S. Hauber, S.J., F.A.I.C.

New York Chapter

Officers for 1953-1954

Chairman, Karl M. Herstein
Vice-Chairman, Savery F. Coneybear
Secretary-treasurer, Richard L. Moore, Foster D. Snell, Inc., 29 West 15th Street, New York 11, N. Y.
Representative to National Council, Dr. M. J. Kelley
Chapter councilor for two-year term, Jack H. Dollinger
Chapter councilors for three-year terms, Dr. Robert Ginell and Robert Mesrobian.

Ohio Chapter

New Officers for 1953-1954

Chairman, Dr. Norbert A. Lange
Chairman Elect, Dr. David M. Gans
Secretary-treasurer, Harold M. Olson, The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio
Representative to National Council, Dr. Malvern J. Hiler

District Directors

Akron: Dr. Eakin M. Glymph
Cincinnati: Dr. Elton S. Cook
Cleveland: Dr. Edward G. Bobalek
Columbus: To be filled by appointment.
Dayton: Eugene R. Ewell
Kentucky-Tennessee: Dr. James E. Magoffin
At Large: Dr. Albert A. Dietz

New Jersey Chapter

New Officers 1953-1954

Chairman, Dr. J. B. Allison
Chairman-elect, Dr. H. W. Mackinney
Treasurer, Dr. W. A. Raimond
Secretary, Dr. W. R. Sullivan, Hoffmann-La Roche, Inc., Nutley 10, N. J.
Representative to National Council, P. J. Gaylor
Chapter Councilors: E. Arundale
M. Bender
Dr. I. G. Garard
W. F. Goepfert
A. Mostello
R. H. Seavy
T. L. Wilson
D. W. Young

Los Angeles Chapter

Chairman, Peter Stupin
Vice Chairman, Dr. Kenneth Newman
Treasurer, Carleton F. Smith
Secretaries, Miss Blanche C. Simons, 718 North Fairfax Ave., Los Angeles 46, Calif.
Paul C. Ressler, Jr., 1341 - 5th St., Glendale 1, Calif.
Representative to National Council, Dr. L. F. Pierce

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For Your Library

Microscopy for Chemists

By H. E. Schaeffer. D. Van Nostrand Company, Inc. 1953. 264 *pp.* 6¼" x 9¾". $4.50.

This volume deals with the application of microscopic procedures in chemical work. The ten chapters cover general principles governing the microscope, and chemical methods on a microscopic scale dealing with inorganic and organic reactions. This book shows very convincingly why every chemical laboratory should have a microscope.

—Dr. Henry Tauber, *F.A.I.C.*

Applied Inorganic Analysis

2nd Edition. By Hillebrand, Lundell, Bright & Hoffman. John Wiley & Sons, Inc., 1953, *xxii* — 1034. *Price* $15.00.

Hillebrand and Lundell, of course, is the standard reference on general inorganic analytical procedures. The present edition of it, however, makes the reviewer think of a dinosaur.

The book is divided into four major parts, which are headed respectively: General Considerations, The Determination of the Elements, Silicate Rock Analysis and Carbonate Rock Analysis.

In this division its reflects its origin in the splendid manual of analysis published by Dr. Hillebrand many years ago for the U. S. Bureau of Standards. While the contents have been carefully worked over to improve their accuracy, the entire field of modern analytical procedures is brushed aside in a section of 16-pages, under the general heading of Special Operations and Techniques, sub-sections XVI through XXV.

Having himself gone through the difficult old-fashioned school of analytical procedure represented herein, the reviewer would be loath to find fault with it either as a practical procedure or as an educational discipline, and in this respect the book meets the highest standards. Possibly this is all that could be demanded.

Nevertheless, the reviewer feels that students meeting inorganic analysis through this book will be inadequately prepared for the world of 1953 however well they may be prepared for the world of 1920.

As a reference book of exact methods of analysis within its limitations the book leaves nothing to be desired and is most highly recommended.

—Karl M. Herstein, F.A.I.C.

Chemical Books Abroad

RUDOLPH SEIDEN, F.A.I.C.

The Chemist and Druggist, London WC 2: *Chemist's Dictionary of Medical Terms;* 6th ed., 304 pp.; 8s6d.—This volume will be of utmost value to anyone looking for quick, accurate, and concise information on thousands of medical terms commonly found in medical and pharmaceutical-chemical literature.

Institute of Biology, London WC 1: *Freezing and Drying;* 206 pp.; paper covers. The 19 papers read at a symposium of the Royal Institute in June, 1951, are reprinted in this copiously illustrated pamphlet; the relevant discussions following each of the four sessions are also recorded. These sessions dealt with industrial applications of freeze-drying (to antibiotics, foodstuffs, etc.) and the design of equipment; the preservation of mammalian cells at low temperatures; the freeze-drying of bacteria and viruses; and tissue fixation by freezing and drying.

Eugen Ulmer Verlag: *Praktische Viehfuetterung,* by Karl Richter; 27th ed., 80 pp.; paper covers, DM 2.—Practical formulas for the mixing of rations for all species of farm animals, with an extensive tabulation of the nutrient content of the common feedstuffs.

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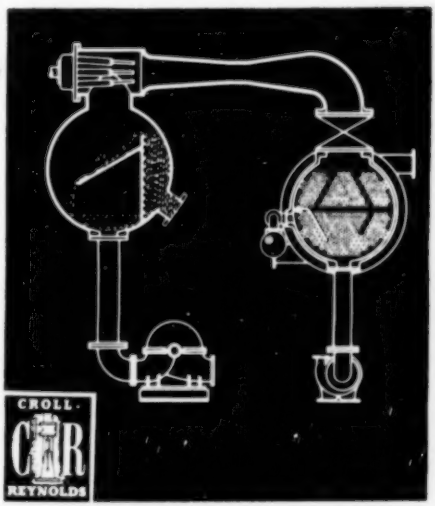

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Communications

Takes Exception

To the Editor:

I am sorry that I must take exception to Dr. Roger Adams' statement on page 251 of the May CHEMIST. I have always advised my graduating students to inquire of their employers when they have been in service for an appreciable length of time, "How am I getting along, is my work satisfactory?", telling them that if the employer took the hint in case of satisfactory service and properly rewarded them, they should remain in his service. If, on the other hand, adequate recognition was lacking, I advised them to look elsewhere for a job.

In every case I have told the graduating student not to accept a counter offer from his present employer. If an employer cannot appreicate an employee until he gets an offer elsewhere he is the wrong employer.

—DR. ALEXANDER SILVERMAN,
Hon AIC
Prof. of Chemistry, Emeritus
University of Pittsburgh

In Memory of James Vail

To the Editor:

Pendle Hill Publications (a nonprofit enterprise which publishes six pamphlets per year on religious and social themes) is planning a pamphlet from the writings and speeches of the late James Vail (F.A.I.C.). His article: "The Chemist and His Neighbors," in the July 1951 issue of THE CHEMIST is one that we would like to use . . . As you may know, James Vail was very close to Pendle Hill, being a member of our Board of Managers, and was very active in the work going on here.

—Peter Docili
Publications Secretary

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Appreciated

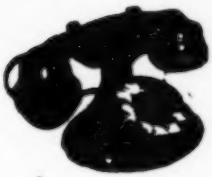
To the Editor:

Congratulations on the fine job you did in presenting the recent story on the Glenn Seaborg Award Dinner in Los Angeles. We in the West appreciate the recognition offered through THE CHEMIST.

—Dr. Frederick G. Sawyer,
F.A.I.C.

Promoted: William H. Burkhart to executive vice president of Lever Brothers Company, New York.

NEW YORK AREA



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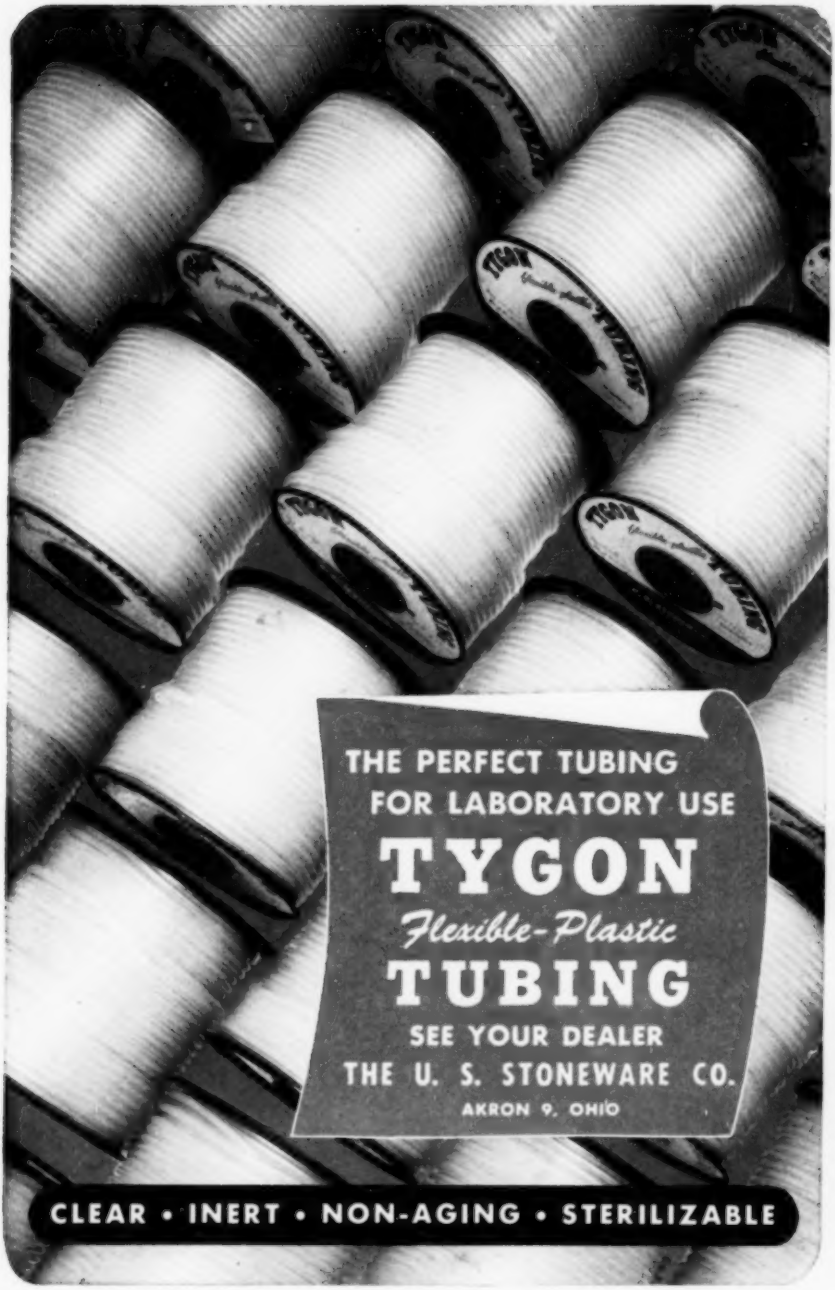
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